

UNIVERSITY OF CALIFORNIA.

AGRICULTURAL EXPERIMENT STATION.

BERKELEY, CAL.

E. W. HILGARD, Director.

BULLETIN No. 118

DISTRIBUTION OF SEEDS AND PLANTS.

By E. J. WICKSON, Professor of Agricultural Practice.

Public interest in the plant introduction and distribution work of the Station was well maintained last year, and responsive reports on the part of those who participated in the distribution convey much interesting and important information. We desire to remind all correspondents that they assume the obligation of reporting to us and in the discharge of this obligation lies the greater public interest of their undertaking. We expect to hear during the next few weeks the results of many more trials. It matters not whether the reports be of successes or failures; both are instructive and significant, especially if the correspondent makes some effort to describe the conditions which seem to be involved in the result.

The dimensions of last year's distribution are indicated by the following brief summary. A fuller account will be found in an annual report soon to be issued:

Number of applicants.....	1,184
Packages sent by mail.....	1,446
Packages sent by express.....	171
Plants and roots distributed.....	27,329
Packets of seed distributed.....	8,983
Postoffices reached.....	427
Counties reached.....	52

All the foregoing figures relate to distribution within the State of California. Distribution is not undertaken beyond State lines except in exchange for material desired by us, and there were 56 such distant exchanges made last year.

The importance of the service rendered to this distribution by the outlying culture Stations of the University is being more clearly demon-

strated each year. The seed product of the Garden of Economic Plants at Berkeley is being notably supplemented by the product of the Stations at Pomona, Santa Monica and Tulare. In this, as well as in other respects, the anticipation of advantage in having local establishments representing the diverse conditions of soil and climate in different parts of California is being realized.

Aims and Methods of Distribution.

To reduce as much as practicable the vast amount of correspondence which is entailed upon the Station by the distribution, we desire that the following points should be carefully considered by all applicants:

First—Do not apply for things not mentioned in *this* bulletin. We cannot usually supply things previously offered for distribution. Do not apply for common garden seeds, fruit trees, or ornamentals, which can be purchased at seed stores or nurseries. We cannot supply them.

Second—Do not make a general request "for anything which will do in this locality." Apply specifically for what interests you, or may prove of value to you.

Third—We cannot undertake distribution to citizens of other States, except in exchange for something which we desire for trial.

Fourth—We require the applicant to pay a small amount for each thing received, partly to bear the cost of distribution, but chiefly as a guaranty that he has not merely an idle desire for what can be had for nothing, but intends to make trial for a definite end and will report results to us.

Fifth—Applications may be made for one or more kinds of seeds, *but an applicant should not order more than one package of a kind.* If the supply of any kind of seed becomes exhausted the money will be returned, unless a second choice is mentioned by the sender. Postal notes are requested instead of stamps, whenever practicable. Any surplus left after filling orders will, as far as possible, be returned to the senders, deducting letter postage.

Trees and Shrubs.

THE CAMPHOR TREE (*Cinnamomum camphora*).—Attention has been widely called of late to the desirability of the Camphor tree for growth in California valleys and foothills either as an ornamental tree or as a possible source of profit for its timber and for the gum and oil which are derived from it by simple distilling processes. The camphor tree was introduced to California at least 25 years ago and was among the first plants distributed from the University. There is therefore at the present time ample demonstration of the hardiness, drouth-resistance, and beauty of the tree and, so far as its growth is concerned, it is an eminently safe tree to plant for ornamental or forest purposes. Concerning profit to be derived from its planting we do not undertake to give assurance. The tree is a handsome, broad-leaved evergreen, attaining large size and noticeable by the characteristic light green of its foliage. It endures in California a temperature as low as 20° Fahr., and is probably about as hardy as the olive. It has endured without injury temperature that has killed large trees of *eucalyptus globulus* and *acacia mollissima*, and thrifty trees can be found in California valleys as far north as Shasta county. It succeeds on a great variety of soils but makes its best growth on rich, retentive soil. The trees can be readily grown from seed, which should be planted in sandy loam in January or February, according to the time when the soil becomes warm, covered about one-half inch and kept moist but not wet. Growth in seed-boxes protected from cold winds and with partial shade until the plants are in full leaf is to be commended. From the boxes transplant into nursery rows early in the fall, retaining the earth about the roots as much as possible and using water if the soil is dry. The trees endure transplanting even when of considerable size by the treatment usually accorded olive or orange trees. Seed, 5 cts. per packet.

DESIRABLE EUCALYPTS AND ACACIAS.—Although some parts of the State, notably the southern counties, have made commendable progress in distribution of eucalyptus and acacia species, it may be truly said that Californians generally only know a few of the species which were distribu-

ted through the nursery trade many years ago. At the University Forestry Station at Santa Monica a number of the less known species are now bearing seed, and furnish material for distribution which, we trust, will bring trees into the possession of those who might not otherwise obtain them, and thus wider experimental data of the desirability and adaptability of the species can be secured. The following brief descriptive notes of the sorts we offer this year are prepared by Mr. J. H. Barber, foreman at Santa Monica, from his own observation of the trees under his charge:

EUCALYPTS.

1. *Eucalyptus polyanthema*.—Fine tree of full habit, well-branched, with heavy foliage, leaves ovate to rounded in shape, gray-green to soft blue-gray in color. Flowers small, white, in close clusters on ends of branchlets, much resembling gigantic heads of mignonette. Bark roughish, brown, persistent. Blooms in January, February, March, very profusely. Very useful for "breeding up" bees at that season. Wood hard, close-grained, resembling box; excellent fuel. Growth fairly rapid. Height 35 feet, girth 36 inches in eight years from seed, on light soil, without irrigation. Hardy, withstands considerable frost.

2. *E. eugenioides*.—Straight-stemmed tree of good appearance. Leaves small, lanceolate, sickle-shaped. Flowers white, in small, close clusters; April, May, June, and sometimes also in fall. Bark thick, soft, stringy, persistent. Growth in eight years from seed: height 28 feet, girth 24 inches, on light soil, without irrigation.

3. *E. diversicolor*.—The "Karri." Straight, well-branched, symmetrical tree. Leaves ovate-lanceolate, pointed, dark-green, glossy. Flowers white, in heavy clusters; April, May, June, and again in November. Bark smooth, gray-brown, persistent for some years. Profuse bloomer; useful for bees. Good shade tree; yields valuable timber. Growth rapid. Height 40 feet, girth 27 inches, in same time and under same conditions as above.

4. *E. cornuta* var. *Lehmannii*.—Displays tendency to divide into several stems at or near ground, making a spreading tree. Leaves small, oblong, thick in texture, dull-green. Flower buds very large, resembling close clusters of horns; flowers in large, globular heads of apple-green filaments; fruit in large, close, spiny clusters; all very remarkable. Blooms July, August, September. Growth (time and conditions as above)—height 24 feet, spread of branches 30 feet. Valuable as an ornamental and as a botanical curiosity.

5. *E. cornuta*.—Much larger and more rapid growing than the var. *Lehmannii*, but has something of same tendency to divide at or near the ground in many cases. Leaves lanceolate, dull-green, but shining in sunlight. Flower buds, flowers and fruits like the last mentioned, but smaller, and the fruit clusters less compact. Blooms about same time. Growth (time and conditions as above)—height 35 feet, girth 30 inches. A fair shade tree; timber valuable.

6. *E. citriodora* (more correctly, *E. maculata* var. *citriodora*).—Rather slender, straight-stemmed tree, with long, slender, drooping branchlets, and long, narrow, sickle-shaped, bright green leaves. Flowers creamy-white; May, June, July. Bark deciduous in flakes, smooth, beautifully colored in pale grey and lavender tints. Leaves exquisitely lemon-scented, retaining the perfume when dried. Growth (time and conditions as above)—height 40 feet, girth 27 inches. A beautiful and very desirable ornamental. Hardy at Oakland, Cal.

7. *E. robusta*.—Handsome, symmetrically branching tree. Leaves large, ovate-lanceolate, pointed, dark green, glossy, leathery. Flowers large, white; December, January, February. Bark rough, dark brown, persistent. Growth (time and conditions as above)—height 35 feet, girth 30 inches. Free bloomer, valuable for bees. Fine avenue tree, and being planted for this purpose in southern California. Timber valuable.

8. *E. alpina*.—Shrubby mountain species, of spreading habit, with rather close foliage. Leaves ovate, dull green, thick in texture. Flowers white in small, close clusters, not conspicuous; October, November. Buds dark reddish brown, warty, curious. Hardy.

9. *E. obcordata*.—Small, shrubby species. Leaves broadly obovate, dull green, thick in texture. Flowers dull reddish color. Flower stalks broad, flattened, recurved. A curious small tree, valuable for ornamental purposes. Blooms more or less for a great part of the year.

10. *E. calophylla*.—Well-formed tree of regular, symmetrical outline, and rather pyramidal form. Leaves ovate to ovate-lanceolate, pointed, dark green, glossy. Flowers large, white, in large clusters, very conspicuous; August, September, October. Seed capsules large, urn-shaped, remarkable. Bark cinnamon colored, persistent. Wood valuable—strong and light. Growth (time and conditions as above)—height 22 feet, girth 21 inches. Fine ornamental and shade tree.

11. *E. corymbosa*.—Well shaped tree of same type, and same general appearance as the last-named. Leaves intermediate in size and shape between those of *E. calophylla* and *E. diversicolor*. Flowers large, white, in heavy clusters, very conspicuous; September, October, November. Seed capsules medium-sized, urn-shaped. Bark cinnamon colored, persistent. Wood hard, durable underground. Growth (time and conditions as above)—height 30 feet, girth 24 inches. Beautiful ornamental and shade tree.

12. *E. leucosylon* var. *rosea* (syn. *E. sideroxylon* var. *rosea*).—Elegant, upright tree, with drooping branches, and light, glaucous blue foliage. Leaves medium-sized, lanceolate. Flowers pink, in loose clusters along the drooping branchlets; February, March, April. Bark rough, fissured, reddish-brown, very resinous, persistent, contrasting well with the foliage. Growth (time and conditions as above)—height 37 feet, girth 39 inches. Wood of very superior quality. A tree of many attractions.

ACACIAS.

13. *Acacia decurrens*.—The well-known "black wattle" tree of Australia, a medium-sized tree of rapid growth, with beautiful fern-like foliage and brilliant yellow blossoms. The wood is of

some value for use in the arts, and makes excellent fuel, but the principal value of the tree lies in its bark, which is very rich in tannin and is extensively used for tanning purposes.

14. *A. decurrens* var. *normalis* (?).—Differing from the above mainly in the greater beauty and delicacy of its foliage, which in decorative effect may be, not inaptly, compared to that of the asparagus fern. This variety blooms more freely, also, than the above, and its general appearance is much more ornamental.

15. *A. melanoxylon* (blackwood acacia).—An upright, symmetrical, pyramidal tree, with dense foliage. Very neat and trim in appearance, making an excellent sidewalk tree. Wood makes first-class fuel, and also valuable timber for many purposes. Grows rapidly.

16. *A. pycnantha* (golden wattle).—A medium-sized or small tree, well branched, with heavy foliage, and dense clusters of beautiful yellow flowers, borne very profusely in spring time. Bark also very valuable for tanning purposes. Tree of rapid growth, but often suffers from breakage by wind. Very ornamental when in bloom.

17. *A. cyanophylla* (blue leaved).—Low-growing, spreading tree, adapted for parks and lawns. Leaves long and narrow (sometimes nearly a foot in length), bluish. Flowers larger than those of acacias mentioned above, of a rich orange color, borne profusely along the branchlets; very showy. Bark also useful for tanning.

OTHER TREES AND SHRUBS.—The following desirable growths are also offered for trial:

18. *Lagunaria Patersonii*.—A small, compact, evergreen tree, of regular pyramidal form. Leaves ovate, light dull green in color. Flowers large, waxen, bell-shaped, pink to white, very fine and borne very profusely in July and August. Seed pods plump, pale yellow, downy, conspicuous, afterwards shrivelling and turning a dingy brown color. A desirable ornamental for the shrubbery or home garden.

19. *Sterculia diversifolia*.—This is the "bottle tree" of Victoria, a stout, glabrous tree from 20 to 60 feet in height and having a peculiar bottle-shaped trunk. It is a very striking tree in appearance and has shown its adaptation to the coast region at least by its growth at Santa Monica, and it has also done well at Pomona and Tulare.

20. *Crataegus mollis*.—The "scarlet haw" of the Eastern States; a valuable ornamental tree, 20 to 30 feet high, with compact, round head; recommended for street planting.

21. *Cytisus proliferus* ("tagasaste").—A valuable shrub for bees, providing abundance of blossom in December, January and February.

Eucalyptus and other tree seedlings can be easily grown in seed boxes of sandy loam kept warm and moist, but not wet. Cover the seed lightly and partly shade to prevent surface drying. Acacia and tagasaste seed can be handled in the same way, but it should be soaked over night in hot water before sowing. Seed in packets by mail; 2 cents for each variety ordered.

Selected Resistant Vines.

It has been known for years that American wild vines are characterized by every marked differences in degrees of resistance to phylloxera, and especially in adaptability to soils. More recent investigation has shown that not only species differ in this respect, but varieties of the same species show widely different characteristics. As a result of the process of selection varieties have been secured which are far above the average of the species in vigor of growth and development, degree of resistance and general suitability for resistant root purposes. Of the few varieties which have thus demonstrated particular excellence in France we have obtained stock of four varieties which promise best under California conditions, viz:

(1.) For dry soils—that is, soils likely to become somewhat dry in summer—the *Rupestris* "St. George."

(2.) For deep, moist and tolerably rich soils, *Riparia* "Gloire de Montpellier," and "Grande Glabre."

(3.) For heavy, low, lands even if slightly alkaline, hybrid "Solonis."

The discussion of these varieties in detail, and their use as resistants, is published in a University Bulletin which will be sent to all who desire it. It must be understood that these vines do not bear edible grapes; they are merely intended for roots on which to graft the desirable table and wine varieties.

We send rooted vines and advise that they be not introduced in any locality where the phylloxera is not now known to exist. The vines are grown on land free from the insect and will be disinfected before the distribution, but we do not advise the risk of introduction in localities now free.

We will send about 25 rooted vines to each applicant who will send with his application 25 cents to pay for packing, and the vines will be sent by freight or express, the *the charges to be paid by the applicant.*

Table Grapes From Persia.

Though we have distributed these vines for several years, we have not yet been able to fill all requests. They are grapes of the tablelands of Persia, which have won praise from all travelers who have eaten them. The vines are of the *Vitis vinifera*, but the fruit has quite a distinctive character when compared with the varieties chiefly grown in the west of Europe. They are showing much difference in their behavior in California localities and are receiving both praise and condemnation from California growers. Their final standing is still to be determined. The following list is offered :

1. *Paykaynee Razukee*: Bright red, large, long, few seeds
2. *Dizmar*: Light yellow, very sweet, long, tapering.
3. *Kahlillee*: Said to be the earliest in Persia.
4. *Askaree*: Widely grown in Persia and used both for table and drying; black, resembling Cornichon, but considerably earlier.
5. *Rish Baba*: Also a leading variety in the Orient for table and drying, and said to keep until spring.
6. *Hulab*: A large, sweet grape.
7. *Shiraz*: Named from one of the most important grape regions of Persia, where it is a leading sort.
8. *Athakahee*: Red, said to be suited for long keeping.
9. *Chavooshee*: Green, a rare variety in Persia.
10. *White Shahanee*: Large, oblong, light color.
11. *Black Shahanee*: Presumably like the preceding, except in color.
12. *Unnamed Varieties*: We have eight varieties which, in the importation, were designated only by numerals. They are probably as desirable as the others. After fruiting it may be possible to name them if good Persian descriptions can be obtained. If not they may be given local names.

We will send one vine of each kind at the rate 5 cents for each variety ordered, by mail, postpaid.

Plants for Green-Manuring.

We are still pursuing our effort to secure a leguminous plant which will prove satisfactory for green-manuring in California. As explained in earlier publications of the Station, it is necessary to have a plant which will make a heavy growth during the winter months, so that it can be plowed in early in the spring and the ground put in shape for the thorough surface pulverization which largely prevents evaporation of moisture during our long, dry summer. For this reason we cannot use many plants which are used for green-manuring in humid climates. Crimson clover, cow peas, etc., do not make good winter growth. The square-pod pea (*Lotus tetragonolobus*) is better, but still too scant in its winter growth. The common "bur clover" (*Medicago denticulata*) and its near relative "snail clover" (*M. turbinata*) are proving very satisfactory in some parts of the State, and the "Canadian field pea" is coming into quite wide use in some of the southern citrus orchards. Experiments are also in progress with the native lupins which may yield valuable results. We offer this year still another plant for trial, which we desire to have planted on a small scale in many localities to determine its hardiness and thrift under our winter conditions of heat and moisture.

FENUGREEK (*Trigonella fœnum græcum*).—This is an old plant of the Mediterranean region. It is of the clover tribe: an annual which, under favorable conditions, produces a heavy weight of stem and foliage. It is used in the old countries for hay-flavoring: the seed also has aromatic qual-

ity and special uses in veterinary medicine. But it is rather for its possibilities in the green-manure line that we desire its trial, and this use is suggested by the report of the Director of the Botanical Service of Algeria and Tunis, which mentions a trial of fenugreek sown in the autumn which produced by the first of the following March a weight of 25 tons per acre of green forage. The part of the field which was allowed to ripen produced about 1400 lbs. of seed per acre. We wish to determine by local trial whether the plant will endure our winter frosts and, if so, whether its winter growth is greater than that of other legumes mentioned above. Prepare the land and sow the seed in the same manner as alfalfa, covering very lightly. If the plant makes a promising winter growth, allow it to bear seed for wider trial and earlier sowing next autumn. Seed 5 cts. per packet, postpaid.

SNAIL CLOVER (*Medicago turbinata*).—The availability of this plant for green-manuring, especially in regions of abundant winter rains, has been approved by a number of experimenters during the last year, and we offer the seed again to those who desire to make trial of the plant. Soak the pods and sow rather thinly broadcast as early as the ground can be put into shape, and cover by raking or harrowing. Seed in 12-ounce parcels, 10 cents each by mail.

Dry Land Grasses and Forage Plants.

The grasses which years of trial have shown to be best for moderately dry lands in California, especially the uplands of the coast region, are "Australian Rye Grass" (*Lolium perenne*), "Orchard Grass" (*Dactylis glomerata*), "Red Top" (*Agrostis vulgaris*), and "Meadow Soft Grass," locally called "Mesquite" (*Holcus lanatus*). All these can be purchased at the seed stores, and for this reason we do not distribute them. In addition to the foregoing we offer the following list, including grasses of our own introduction, which are proving valuable where the heat and aridity are not too great. The seeds should be sown in places where their growth can be conveniently watched, so that each grower can determine for himself which ones should be largely sown the following year. By collecting seed from a small plot a large area can soon be secured :

1. Tall Oat grass (*Arrhenatherum avenaceum*).
2. Awnless Brome grass (*Bromus inermis*).
3. Schrader's Brome grass (*Bromus unioloides*).
4. Japanese Wheat grass (*Agropyrum japonicum*).
5. Many-flowered Millet grass (*Milium multiflorum*).
6. Hairy-flowered Paspulum (*Paspalum dilatatum*).
7. Texas Blue grass (*Poa arachnifera*) roots.

LATER INTRODUCTIONS.—The foregoing grasses have been quite fully characterized in our previous reports. During the last two years we have largely extended our collections of grasses through co-operation with the Division of Agrostology of the United States Department of Agriculture in trial of species of which they furnished seed. Out of about 150 species thus secured a few have shown very promising growth, and these we offer for wider trial by our correspondents.

8. Yellow Oat grass (*Trisetum pratense*).
9. Various-leafed fescue (*Festuca heterophylla*).
10. Teff (*Eragrostis Abyssinica*).
11. Crab grass (*Eragrostis neo-Mexicana*).
12. Texas Millet (*Panicum texanum*).
13. Tall Grama grass (*Bouteloua racemosa*).
14. Buffalo grass (*Buchloe dactyloides*), roots.

Most of these grasses are native species from the interior and capable of enduring hardship. The last of the series, Buffalo grass, has the same

habit of growth as Bermuda grass, but it has finer stems and makes better winter growth. Still it should not be planted in places where it is not desired to have it stay and spread.

Of any of the above, except Nos. 7 and 14, we will send seed at 5 cents each per package. Nos. 7 and 14 grow best from the *roots*, of which we send a package for 10 cents each.

FLAT PEA (*Lathyrus sylvestris*).—This plant does not succeed in the presence of the greatest heat and drought, but it maintains heavy growth with very little moisture. It is specially approved by Mr. E. C. W. Macdonald of Aptos, Santa Cruz county, after several years continued trial, for summer and early fall growth without irrigation, and he finds that stock eat it readily if they are introduced to it when the growth is young and tender, and after that they will keep to it all right. He had grown good lambs fed on this plant alone. It is valuable to keep hill lands from washing. It does not start growth in the spring until the ground is warm, but it continues growth all through the dry summer by virtue of its deep rooting and outgrows summer weeds; even sorrel has no chance with it. It is commended for further trial on coast lands which are deficient in growth of better plants. We have no seed but will furnish roots at 10 cts. per package.

Forage Plants for Alkali Soil.

SALT BUSHES.—Farther trial of salt bushes from Australia at the University culture stations at Tulare, Santa Monica and Pomona is showing that several species are likely to be valuable in California and that selection will be ultimately made upon both manner of growth and adaptation to local conditions of soil and climate.

AUSTRALIAN SALT BUSH (*Atriplex semibaccata*).—The value of this plant has been demonstrated beyond question for lands too alkaline for the growth of ordinary forage plants. But three years have elapsed since our first general distribution of the seed and yet so rapid has the fame of the plant extended that thousands of acres of waste alkali land have already been made valuable by its growth. The seed is now in the market and can be supplied by any California seedman. We still, however, have an overwhelming demand for small trial packages and therefore continue the distribution for another year.

Salt Bush No. 2. (*Atriplex leptocarpa*).—This East Australian species was first distributed from this Station two years ago. It has shown special adaptation to situations where the summer heat is less than in the upper San Joaquin valley. At Santa Monica and on heavier lands near Pomona it has made better growth than the *semibaccata* and is apparently quite as good for stock feeding.

MEALY SALT BUSH (*Atriplex halimoides*).—This species promises to surpass the *semibaccata* on dry lands and gives indications of being valuable on so-called desert situations. It is native to the central desert regions of Australia. It makes very rapid growth and begins to bear seed in three months after sowing. If cut or pastured down, it forms a very compact mass of soft new growth very unlike that of *semibaccata*. The plant is covered with a heavy whitish, scaly dust which seems to justify a popular name as "mealy salt bush." It makes a taller growth than *semibaccata*.

BLADDERY SALT BUSH (*Atriplex vesicaria*).—This species is easily recognized by the profusion of small bladder-like vessels which occur amidst the foliage and enclose the seed. Otherwise it much resembles the *halimoides* in growth and appearance, and should be tested beside it to determine the comparative drought resistance of the two.

Seed of salt bushes is sown in Australia on the unplowed desert after a rain, and sheep are driven over it to tread it in. On alkali soil the seed is more apt to rot if covered. Our rule is: firm the seed in the soil at time of first rains, or else late (when the ground is again warmer). Scattered in cold, wet ground in midwinter the seed is apt to fail. We send seed in packets: 5 cts. for each kind ordered, postpaid.

MODIOLA (*Modiola decumbens*).—This plant, which is a native of Chile, was first observed growing freely on alkali lands in Kern county, and many who grew the plant from our seed last year praise it very highly; sheep and cows eat it in preference to alfalfa, and improve in flow of milk. It is almost as rich in flesh-forming ingredients as alfalfa; in this respect it is superior to the salt bushes. The plant may be valuable on dry and waste places, even when very alkaline; but it *must be introduced with caution*, because it has a habit of rooting from its prostrate stems, and there-

fore may be difficult to eradicate. In this respect it is very different from the salt bushes. To those who desire to try the modiola in places which are waste and remote from cultivated lands we will send small packets of seed at 2 cents each.

Fiber Plants.

COTTON.—At our station at Pomona we have grown this year several choice varieties of Georgia cotton, which have attracted much attention. We offer these in the boll that they may serve to demonstrate to the young people in home or school how cotton occurs in nature, and will enable them to take out the seed and pursue their nature study by growing the plants in the home garden or school yard. Postpaid, 5 cents per package.

FLAX.—Similar use can also be made of this important fiber plant, though it will also serve a commercial purpose. The best variety *for seed* production is that known as Californian; for fiber and seed combined, we offer four varieties of the best European fiber flaxes, which attain about twice the length of stem of the variety grown for seed in this State. The whole list is as follows: No. 1, White-flowering French; No. 2, Royal of Germany; No. 3, Russian; No. 4, Yellow-seeded; No. 5, Californian. Flax is hardy, and withstands ordinary California winter frosts. It should be sown early—at about the same time cereals are sown. We send seed in 1-lb. sacks, 15 cents for each variety, by mail, postpaid.

For Field and Garden.

CANAIGRE (*Rumex hymenosepalus*).—The plant which is attracting so much attention as a source of tannin. Seed 5 cts. per package, or *roots* 25 cts. per package, postpaid.

JERUSALEM ARTICHOKE (*Helianthus tuberosus*).—We have two varieties—White French and Red Brazilian. The former is highly esteemed by some as a table vegetable, either boiled or used in soups or salads. The red variety is perhaps superior for stock purposes. We can furnish both sorts if desired at 10 cts. per package each, by mail postpaid.

ROSELLE (*Hibiscus sabdariffa*).—A tender plant producing in dry, hot regions a juicy pod which makes delicious jelly. Full description in last year's bulletin. Seeds 3 cts. per packet.

NEW SHORT WHITE CARROT.—Very thrifty. Highly approved by our correspondents. 3 cts. per packet, postpaid.

WASHINGTON MARKET CORN.—Commended as a late showy variety. 5 cts. per packet, postpaid.

CARLTON CLUB RHUBARB.—Large stems and good quality. Roots 15 cts. each, postpaid.

VEITCH'S CLIMBING FRENCH BEAN.—Certificated at English shows; does well without poles. 5 cts per packet, postpaid.

EDIBLE POD PEA.—An English variety highly approved in California. 3 cents per packet, postpaid.

Application for seeds and plants should be made *as soon as this announcement is received*. We are unable to continue distribution throughout the year.

Address, E. J. WICKSON,

BERKELEY, December 5, 1897.

Berkeley, Cal.